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The Treatment of War Wounds

I.—Abstract of Recent Contributions to the Literature;

II.—Review of the Situation in regard to Animals

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I

A most informative and comprehensive series of articles has recently been published in the *Lancet* by R. H. Mitchiner and E. M. Cowell (*Lancet*, 1939, **I**, pp. 41, 104, 171, 228, 287, 347, 408, 469, 534, 601, 639, 719), two well-known consulting surgeons and officers of the Territorial Army, on the subject of medical organisation and surgical practice in air attack on towns. Their views are based on experience gained in the Great War and also the recent civil war in Spain. It is proposed to abstract their articles at some length and subsequently review the situation with regard to animals.

The most important features of war wounds are infection due to the carrying in of dirt with the projectile and the considerable disruption of the tissue around the wound track. Micro-organisms are introduced into severely damaged tissues, often isolated from air, in conditions which favour their rapid growth. As the result of the blast of high explosive bombs many crush injuries and fractures, mainly due to falling masonry, will be met, and in many cases these will be immediately fatal or the victims will be beyond surgical aid by the time they have been rescued from the fallen debris. In the remainder severe mangling of the limbs and compound and simple fractures will be the chief injuries. Many wounds will occur due to the explosion of bombs and falling fragments of shrapnel and shell casing from anti-aircraft shells. They may be lacerated wounds due either to bomb casing, in which case they will probably be most severe, or to fragments of shell cases and shrapnel, when they are usually of moderate severity. Penetrating wounds are usually due to bullets fired from low-flying aircraft, while contusions occur from small fragments of falling masonry. Burns may occur due to incendiary bombs and the resulting fires, and to chemicals such as mustard gas or cordite. In their view the principle to be observed in all war wound surgery in the human subject is the prompt and thorough excision, wherever possible, of the entire wound track together with the damaged surrounding tissue, and primary suture of the resultant wound or delayed suture if primary cannot be carried out without causing tension. As a general rule excision, to be satisfactory, must be performed within twelve hours of infliction, for after this period the chances of obtaining primary union after excision are extremely small. In cases seen after 24 hours and in those in which total excision is impossible (the involvement or close proximity of important structures, and extensive lacerated wounds), *débridement* of the wound must be undertaken. This comprises free excision of crushed and damaged tissue and the provision of adequate drainage from the most dependent part of the wound.

Their views on the use of antiseptics in the treatment of recent wounds should be given prominence. They are that antiseptics in a strength sufficient to destroy micro-organisms have a most deleterious effect on the already damaged tissues and are thus strongly contra-indicated. They state that experience shows that antiseptic dressings cause more damage to the tissue cells than to the micro-organisms and thus encourage the spread of infection. In their view the use of coloured antiseptics may be justifiable in following through the track of a projectile and can be used as a first-aid dressing, but they should be mild ones, such as a 1 per cent. aqueous solution of gentian violet or 1/1,000 acriflavine or brilliant green, which are painless and non-irritant. The use of that popular and painful antiseptic, 2·5 per cent. iodine in spirit, is mentioned only to be condemned.

If time and circumstances permit it is advised that radiography be carried out as a routine in all cases of wounds by projectiles to ascertain if fragments have been left behind and to locate their position, but it is pointed out that when small fragments are deeply imbedded and cause no apparent trouble it is better to leave them *in situ* than undertake an extensive operation the successful results of which are problematical. For the thorough excision and cleansing of wounds anaesthesia is necessary and gas and oxygen is advised preceded by morphine-atropine and supplemented, if necessary, by ether. Chloroform should not be used, while spinal anaesthesia is condemned in patients suffering from shock and loss of blood. Local infiltration anaesthesia is considered inadvisable for the oedema thus provoked in the area of the wound favours the growth of micro-organisms and retards healing. Stress is laid on the fact that with penetrating wounds severe injury and infection of deep tissues may occur while the small superficial wound readily heals.

For the prevention of shock it is advised that pain shall be relieved by the early administration of small doses of morphine, chill prevented by the application of warmth, and bleeding checked by appropriate first-aid measures. In the case of burns tannic acid treatment must be applied at once. In cases of established shock the necessity for giving fluids is stressed. In severe cases glucose-saline solution by rectal infusion or intravenous injection is advised. In the latter method it is pointed out that the best results are obtained by giving insulin at the same time. The necessity for the speedy and effective control of haemorrhage is emphasised. Continuous unchecked oozing from a wound of moderate size may be more dangerous than bleeding from a severed limb, for the latter attracts attention and is treated with a tourniquet. Efficient first-aid, if it can be carried out with a minimum of delay, is said to be definitely desirable. It is stated that in Barcelona the value of speed (presumably for the application of radical surgical treatment—J. G. W.) was so appreciated that casualties were often taken direct to the hospital without preliminary dressing. The authors urge that careful judgment be exercised in the use of the tourniquet. The subject of blood transfusion is dealt with at some length, and referring to the war in Spain it is stated that the Spanish Government's blood transfusion service was a magnificent model organisation run by the Army Medical Service. When dealing with wounds in which infection is already established advice is given on the following lines: conservative treatment—hypertonic saline dressings frequently changed and the provision of adequate drainage—is essential, but if suppuration tracks into the surrounding tissues incision must be made to secure drainage. So soon as signs of infection appear in the wound the part must be put at rest and maintained thus, if necessary by adequate splintage. In deep wounds in which adequate drainage is impracticable it is advised that continuous irrigation (Carrel-Dakin), using a 10 per cent. hypertonic saline solution or a 1 per cent. gentian violet or a 1/1,000 solution of acriflavine, should be adopted. It is stated that it is the mechanical washing far more than the action of the antiseptic that is responsible for any improvement. In the connection of enforced rest for the wounded tissues, it is appropriate to refer here to the method of treatment of war wounds and compound fractures introduced by Trueta, of Barcelona (*Lancet*, 1939, **1**, 1452: Treatment of War Wounds and Fractures, J. Trueta, M.D. London: Hamish Hamilton Medical Books), which has received prominence in the medical Press. His method comprises briefly, *débridement* and excision of all bruised tissue, dealing radically with muscles and aponeuroses but conservatively with skin and bone; any associated fracture is reduced; the wound completely packed with dry, sterile gauze; and finally the limb encased in plaster of Paris with no window. He stresses the necessity for judgment in the selection of cases and points out that in deciding whether to adopt this conservative treatment or amputate a limb with a compound fracture, the criterion is the state of the circulation in it. In an experience of 1,073 cases, in 0·75 per cent. only was it necessary to remove a plaster because of true clinical infection, whilst in two cases only did gangrene occur.

To return to the recommendations of Mitchiner and Cowell—for the treatment of spreading cutaneous or subcutaneous gangrene prompt excision of the infected area about half an inch beyond the edge of the lesion is advised. Special attention is paid to gas-gangrene. It is pointed out that muscle tissue, especially if it is damaged, is, owing to its large glycogen content, particularly favourable to invasion by anaerobic organisms, and the development of this type of gangrene. Prophylactic treatment consists of the free removal of all infected tissues, directing special attention to muscle. The wound should be left open, exposed to air and irrigated with hydrogen peroxide or Dakin's solution. The injection of hydrogen peroxide round the infected area is said to be of undoubted value in limiting the spread of infection. In localised cases excision and free incision may be tried, but in the massive type amputation of the affected limb well clear of the area will probably be necessary. It is directed that tourniquets, tight bandages, splints or anything else likely to interfere with the blood supply to the damaged part or preclude aeration, should be avoided. *B. welchii* antitoxic

serum should be given. It is advised that in all wound cases a prophylactic injection of anti-tetanic serum should be given as soon as possible. It is pointed out that during the Great War the incidence of tetanus amongst the wounded, which at one time was so high as to threaten to become a scourge, was reduced by the use of serum to practically nil.

In the treatment of burns the essential first-aid measure is efficient coagulation and a 2 to 5 per cent. aqueous solution of tannic acid is the best coagulant. Tannafax jelly is considered to be useful in superficial burns; if no other coagulant can be found lukewarm strong tea is efficient. On admission to hospital the patient is to be anaesthetised and the entire burnt area and six inches of surrounding skin must be thoroughly washed with soap and water and then swabbed, first with methylated spirit and then ether. A gauze compress, soaked in tannic acid solution (medicated with 1/2,000 mercuric chloride) is then to be applied and lightly bandaged to the part. The compress is left undisturbed for two to three weeks. The efficiency of the treatment is said to depend upon thorough cleansing before coagulation and if this cleansing has not been efficiently carried out sepsis will intervene. When this occurs it is advised that the dressing be removed and replaced by one or two thicknesses of gauze soaked in a 1 per cent. solution of gentian violet, after the area has been cleaned. The gauze is to be re-damped with gentian violet at hourly intervals at least six times and more often if a firm coagulum has not formed. In cases of burns by mustard gas it is pointed out that unless the patient has been decontaminated it is impossible to assist him before donning protective clothing and gas mask. Mustard gas can be present on the skin for five to ten minutes before any burns occur, and any of the oily fluid found should be carefully mopped off with cotton wool and the area sponged with methylated spirit and then treated with anti-gas ointment. (A cream of two parts of bleaching powder to one of vaseline, or a paste of bleaching powder and water.) The application should be left for five minutes before removal. Bleaching powder should not be allowed to get into the eyes nor should it be used on an obvious burn of the skin. When a burn has occurred it should be treated, after neutralisation of the gas, with a tannic acid compress as already described. The eyes, if affected, should be irrigated with a 2 per cent. solution of sodium bicarbonate. The patient, having been freed from contaminated clothing, should be immersed in water and thoroughly washed with soap and changes of water for at least five minutes; alternatively the part should be washed for several minutes with a 2 per cent. solution of sodium bicarbonate.

From this point the articles continue to outline the operative procedures to be adopted for wounds of the various specialised organs and structures of the body.

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II

The basic aims of the surgeon and of the veterinary surgeon are identical—the saving of life, either human or animal. But the considerations which govern their efforts differ vastly. It is imperative that the surgeon shall do his utmost to conserve human life, and being fully aware of the great value of his services to the community in war, the country has placed at his command almost unlimited resources for dealing with casualties resulting from enemy attack. He is thus able to exercise his art to its fullest extent. The veterinary surgeon, however, is controlled by a large number of factors all of which serve to hamper him. The chief of these is the economic one. Efficient modern surgical practice, quite apart from remuneration of the individual, is a costly procedure, no less so in animals than it is in man. The responsibility for payment lies with the owner of the animal and for this there is no relief, and thus when concerned with the working horse and the food animals the extent to which the veterinarian will be employed will depend upon the value of the animal in health, and the likelihood of surgical treatment proving successful within a reasonable time. A third, and very important consideration in the horse, is that the animal's natural usefulness shall be completely restored, and it is this factor which so often interferes with the veterinarian's activity. Another aspect which largely governs our actions is the humanitarian one, and in this connection we possess a great advantage over our medical confrères, for if an animal is so wounded that its recovery is beyond the bounds of possibility, or if it is in pain or distress which cannot be relieved, then it is not only our right but our bounden duty to destroy such animal. Quite apart from these considerations there are many technical difficulties which prevent the application of modern surgical methods to animals — their temperament, size and strength, the conditions under which operative procedures must be carried out, and the conditions under which the animal must subsequently be housed. It is quite clear that the modern surgical conception of war wound treatment in the human subject is the early excision and *débridement*, under aseptic conditions, of all injured tissues; treatment which requires not only all the facilities of the modern hospital, but in addition an efficient organisation for the rapid collection and transport of casualties. Such facilities are not available for animals. The hospital surgical unit is the essential

feature of the scheme. Treatment by antiseptics is a secondary consideration. It is becoming realised more and more, not only in medical but in veterinary practice also, that the most important factor in provoking wound sepsis is tissue injury, furthermore that many of the so-called antiseptic agents rather than checking the growth of micro-organisms tend to facilitate it by further interfering with the natural bactericidal powers of the tissue cells. Complete rest for the wounded tissue is an essential part of this treatment, a state of affairs which is difficult or even impossible to effect in large animals.

As far as the writer knows the practice of complete excision of wounded tissue has not been employed in animal surgery, and he visualises great difficulties in carrying it out effectively. The provision of adequate drainage, the removal of foreign bodies and conservative suturing followed by rational antiseptic irrigation has been the common treatment. A search of veterinary literature reveals very little reference to the subject. Bouchet (1933, *Rec. Méd. vét.*, **109**, 11, 840) in a valuable article on the treatment of war wounds in horses, adopts the modern surgical view and recommends surgical ablation of damaged muscle, pointing out that it is necessary to overcome shock, and also is an essential action to counter subsequent infection. This advice, however, may be impossible to carry out. The clean-cut bullet and shrapnel ball wounds of the South African War and the early part of the Great War, which often healed quite readily without complication, will be the exception in the future, and we must anticipate gross lacerations with severe tissue disruption caused by the fragments of high-explosive shells and aerial bombs, in which efficient *débridement* will be most difficult to effect and in addition the enormous wounds resulting therefrom may render such treatment economically unsound. In this connection, the Official History of the War, Veterinary Services (1925) might with advantage be quoted: "Some of the wounds inflicted by pieces of shell were enormous, and even when no bones were fractured or some vital organ involved, in many of these treatment could not be justified on economic grounds on account of the time the lesion would take to heal." And again: "Wounds caused by and still containing pieces of shell gave much trouble, often leading to death from septicaemia with or without the development of gas-gangrene. It was often impossible to discover the contained piece of shell, particularly if it was embedded deeply in a muscular part or had taken an erratic course in its passage through the tissues." It may be taken that the number of wounds containing embedded bomb and shell fragments will be greater in the horse than in man. Many splinters which would have caused through and through wounds in man will be stopped in the horse. A large proportion of such wounds, however, will not be confined to comparatively unimportant structures; there will be frequent penetrations of the chest and abdomen, parts of the skull will be shot away, compound bone fractures will occur and joints will be opened. In the great majority of these destruction will be the only course. During the Great War, from the middle of 1917 onwards, systematic shelling and aerial bombing of waggon-lines became a feature and our equine casualties were enormous. During the period May 1st, 1917, to November 11th, 1918, in France and Flanders 51,308 horses and mules were killed and 67,532 were wounded by enemy fire (the average horse and mule strength of the force during this period was 420,000).

War offers a great incentive to the development of new methods of wound treatment. In the early days of the last war the provision of drainage and antiseptic applications were the vogue. That the great danger of completely closing infected wounds by suturing was realised is indicated by the following instruction issued by the Director of Medical Services, 4th Army, to Casualty Clearing Stations early in 1916: "Neither amputation nor any other wounds should be closed by suture. They should be left completely open." (Official History of the War, Medical Services, Surgery 1, 1922.) Sterile excision of wound and closure by primary or secondary suture was first adopted on a large scale during the battle of the Somme (July, 1916) and quickly became general. It was found to be the most effective method of controlling sepsis and gas-gangrene, and by its adoption healing was greatly accelerated. The progressive application of this treatment in penetrating wounds of the skull, thorax, abdomen and pelvis, makes inspiring and fascinating reading. It makes the veterinary surgeon lament his difficulties and restrictions. There is no doubt that in the future he will apply these methods as far as possible and that the older practice will be supplemented as far as possible by excision. Other methods of wound treatment which originated during the War and which still occupy a very important place in our work, were: the Carrel tube method of irrigation, eusol, eupad and Dakin's solution of sodium hypochlorite, Sir Almroth Wright's hypertonic saline treatment, the salt-pack treatment, Bipp and flavine solutions. During the past few years the great value of sulphanilamide and its allied compounds in the treatment of streptococcal infections in the horse has been recognised and there is no doubt that it will form a valuable adjunct to local treatment of septic wounds. Another new, and somewhat unorthodox, method of treatment of septic wounds

which has come into prominence since the war, particularly in America, is the use of maggots. The treatment comprises the introduction into the wound of the active larvae of the blow-fly. The excretions of the maggots possess the property of liquefying and removing necrotic tissue and bacteria and promoting the growth of healthy granulation tissue. It is thought that urea and allantoin are responsible for this action. Dixon, O. H. (1933—*Vet. Bull.*, **27**, 16) reports favourably on the method in the treatment of suppurating wounds in the horse. The treatment of wounds by urea is by no means new, but it is again gaining prominence. Cod liver oil is another agent which has been used during recent years for chronic infected wounds and in this country two members of our profession have reported favourably on its use in animals—Sparling, P. S. (1934. *Jour. R.A.V.C.*, **6**, 40) and Dykes, G. (1937. *Vet. Rec.*, **49**, 649).

Apropos the incidence of tetanus in wounded horses it is interesting to note that in France in 1918 the suspension of the use of serum (on economic grounds) was not followed by any increase in the occurrence of the disease.

Times have changed since 1914. Our Army is now a highly mechanised one and the horse as a factor in transport has become a back number therein. The veterinary officer has been replaced by the motor repair unit. There are some of us who believe that the almost complete elimination of the horse to have been an error, for despite the advance in the science of mechanisation the fields of France and Flanders are unchanged and they may again become the quagmire that they were in 1917. We may again have to call upon the horse to take food and water to the troops and ammunition to the guns. Our profession must be prepared and ready to attend their wounds.

BLEACH OINTMENT

At a recent meeting of the Executive of the National Pharmaceutical Union, the Secretary reported that a successful defence had been put forward to two summonses against members under the Food and Drugs (Adulteration) Act alleging that bleach ointment not of the nature, substance, and quality demanded had been supplied. The local authority concerned had sought to set up as a legal standard the formula for bleach ointment given in the A.R.P. Handbook, but had not been successful in this. Nevertheless, in the public interest it was desirable that members should realise the importance of making bleach ointment with a satisfactory sample of bleaching powder, and, if obtainable, with a stabilised variety of this product.

Representations had been made to the Ministry of Home Security against the use of the title "Bleach Ointment" on the grounds that the word "ointment" is ill-chosen and likely to cause confusion, since the product is not to be used for a purpose and in the manner in which ointments are in general to be used. Alternative titles, which would not result in such confusion of the mode or purpose of use, had been put forward for consideration.

The Veterinary Record

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A Good Augury

In last week's *Veterinary Record* we published the announcement that the Minister of Agriculture had added the name of Professor Dalling to the war-time Advisory Poultry Committee and in the same issue we reported the proceedings of the Central Veterinary Society in which the President of this Division, in the course of his address from the Chair, stated that (to quote the report), "the Ministry of Health had a rather different outlook with regard to their duties than the Ministry of Agriculture, who were still hampered by the old title of one of its branches—the Diseases of Animals Branch—and were not yet adjusted to the wider outlook implied by the new designation—the Animal Health Division."

Those of our readers who are concerned with the future well-being of our profession—and who is not?—will appreciate the truth of this statement so far as this aspect of our work is concerned. We believe that our future ability to serve the livestock industry will depend upon the degree to which Government departments, the public and the governing body of the profession assess the relative value and importance of the words "health" and "disease." Until it is fully realised that it is not only undesirable but also impracticable to consider these subjects separately the profession will never attain that position in the world of science to which it is entitled both by experience and by merit.

Who among our members, having represented the Association at conferences, on deputations to the various Ministries, or in personal interviews with the heads of departments, has not felt the dead hand of "disease" close the door on their aspirations for wider service should they, unwittingly or by design, allow intrusion of the word "health" into their expression of these hopes? How often have our emissaries been told that this or that is not the concern of the veterinary profession because the question of the "treatment of disease" does not arise—told it so often that, if the representatives of this Association were not unassailably imbued with foresight, optimism and determination, they would long ago have given up the fight?

The thought is inconceivable to those whose breadth of vision has not become narrowed by years of work within a restricted field that any

problem of either health or disease—medical, veterinary or purely agricultural—can be solved by any one group of workers. As a profession we live in close contact with these problems and know that there are few questions associated, for example, with livestock—be it concerned with breeding, rearing, feeding, health or disease—upon which veterinary opinion cannot speak with knowledge and authority.

How tiring it becomes to hear that a particular problem concerns only the medical profession, the veterinary profession, the Department of Agriculture, the sanitary authorities, etc. Such an endeavour to pigeonhole problems results in impaired efficiency, wastage, avoidable overlapping, and is productive of friction and ill feeling. If a real "team" spirit exists, dove-tailing replaces overlapping, economy supersedes wastage and mutual respect and appreciation prevent friction. The inevitable result is benefit to each and to the common weal.

We are convinced that this appointment augurs well for the future and we hope and believe that here is the first unequivocal sign of official appreciation of the truth of our assertions. Recently, in the House of Commons, the Minister of Agriculture, in reply to a question, stated that, "As questions of disease will not be referred to the (Poultry Advisory) Committee for consideration, I did not consider it necessary to include any veterinary representative in the membership." This statement the Association refuted by every means open to it. It was explained to its representatives that there was a possibility that the time of a veterinarian would be wasted, since it was not contemplated that subjects would be discussed which could possibly interest him or the veterinary profession—but our representatives remained unconvinced; they continued to argue that if the Committee was concerned with livestock then it was not possible for its activities to be other than of concern to the veterinary profession.

Their efforts have succeeded, and we pay generous tribute to those who heard them so patiently and who, we believe, being convinced, will in future help to enlighten their colleagues.

To Professor Dalling we express our thanks for agreeing to accept the appointment. We are glad to think that the profession will be represented by one so well fitted for the task.

CLINICAL COMMUNICATION

Deformed Genital Organs in a Foal

GEORGE WYSE, M.R.C.V.S.
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Subject.—A bay Shire foal.

History.—This foal had been delivered on Saturday morning, May 20th, by a three-year-old Shire mare. The foal at first seemed quite normal; the meconium was passed within two hours, and the foal made to suck, although the mare was a trifle ill tempered and kicked at the foal once or twice. Towards evening the owner noticed that the young animal had slight colic pains and was stretching itself, as if trying to urinate. The next morning it seemed quite normal, but towards evening as the owner had seen no sign of the animal urinating, and observed that it was "not quite normal behind" he consulted us regarding the case.

Features.—The case was seen next morning, and on casual inspection the foal seemed normal. On closer inspection of the genital organs it was at first thought that it was a filly foal with an elongated imperforate vulva, but on manipulation in the scrotal region two well-developed testicles were found. What on first inspection seemed to be an elongated vulva with a very enlarged glans clitoris, was found to be the urethra which had not been formed into a channel as in a normal case, to be surrounded with the corpus spongiosum urethrae, but had become flattened out with two prominent lips, simulating an imperforate vulva.

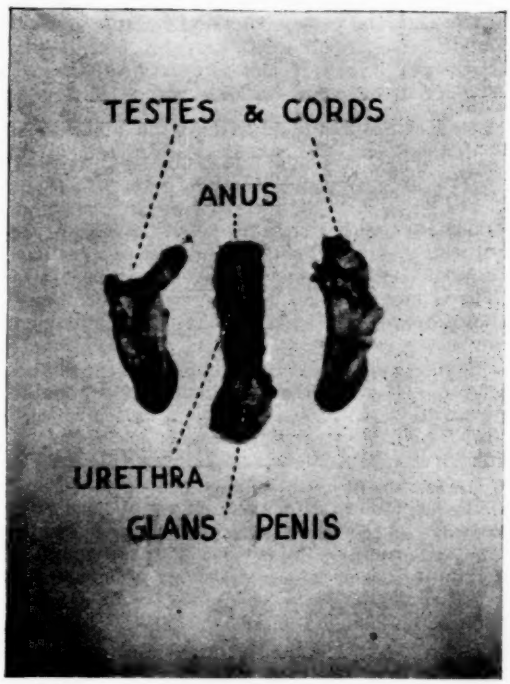
This malformed penis beginning about half-an-inch below the anus, was about six inches in length, terminating in a large free extremity, which on close inspection proved to be a well-developed glans penis.

At the dorsal commissure there was a channel about an eighth of an inch in diameter and when this was explored with a blunt-pointed probe, the latter was found only to pass about an inch into the pelvic regions, when an obstruction was found.

As no urine had been passed, a catheter was pushed through the obstruction, but no contact could be made with the bladder.

Post-mortem Examination Results.—As the foal was now showing pain with elevated temperature and pulse, it was decided to destroy it. On *post-mortem* examination a complete set of male genital organs was present,

although half-an-inch separated the greatly distended bladder from the commencement of the malformed urethra which was quite normal in the pelvic regions where it became perforate as it curved over the ischial arch.



COD LIVER OIL

"This widely used commodity figures very prominently in pharmaceutical news at the present time," observes a contributor to the *Pharmaceutical Journal*, who proceeds: "Cod liver oil enjoyed a reputation as a valuable medicine long before anything was known of the substances to which its therapeutic properties are due. Apparently the first recorded use of the oil was by Darbey at the Manchester Infirmary in 1789, where it was used for the treatment of excruciating rheumatism. Long before this, however, its virtues were known to fishermen along the coast of Northern Europe, in the Shetland Isles and the North of Scotland. Sixty years ago cod liver oil was considered to be one of the most suitable medicines for the treatment of tuberculosis. Only within the last 20 years or so has the function of the fat soluble vitamins been understood, and in these substances is the accepted cause of the benefits to be derived from taking the oil. In the days when the presence of vitamins was unsuspected and the value of the oil was ascribed to minute quantities of iodine or to some peculiar properties of the unsaturated fatty acids, its use was at least as widespread as at the present time when developments in its manufacture, as well as a careful check on its vitamin content, have helped to improve the quality of the oil and to increase its price."

ABSTRACTS

[Fractures. Trum, B. F. *Vet. Bull. U.S. Army.* **33.** 118-121.]

During the last eight years 797 cases of fractures of the leg bones of horses were reported from the U.S. Army depôts. Of these 149 were returned to duty (18·7 per cent.). Thirty per cent. of simple fractures, 15 per cent. of compound, and only 5 per cent. of comminuted fractures healed satisfactorily. Over 34 per cent. of cases of fracture above the elbow and stifle joints returned to duty. Complete fracture in these areas is rare with the exception of that of the wing of the ilium which heals with deformity but usually without disability. The long bones of fore and hind limbs heal at about the same rate. The tibia is fractured most frequently and few cases heal well. Of 174 cases recorded (22 per cent. of all fractures) only three returned to work. Fracture of the radius is also very serious, only four cases recovering out of 109. Of fractures of the metacarpus and metatarsus only nine returned to duty out of 114 cases, and these required extended convalescence. One comminuted fracture of the metatarsus was treated for 125 days, and three simple metacarpal fractures for 107 days each. No attempts were made to treat fractures of the patella or the second phalanx. According to the records the first phalanx is fractured 25 times more frequently than the second. Fractures of the ilium heal well: seventy-eight of 122 cases returned to duty (64 per cent.).

From an economic viewpoint young animals repay a chance of recovery better than old, and slow draught horses tolerate unfortunate callus formation better than riding horses. In young slow-working animals practically all fractures are worth a trial.

D. D. O.

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[Intra-Arterial Hypertonic Saline in Shock. Kendrick, D. B. (Jr.), Wakim, K. G. *Proc. Soc. Exp. Biol. Med. N.Y.* **40.** 114-116. (2 refs.).]

The possibility of using hypertonic sodium chloride as a treatment of traumatic shock was suggested when it was found that the intra-arterial injection of 5 to 10 c.c. of a 25 per cent. solution caused prolonged elevation of blood pressure.

A number of dogs were anaesthetised with nembutal. In some a state of shock was produced by intestinal manipulation, in others the spinal cords were sectioned at the seventh cervical vertebra and in others adrenalectomy was performed. All then received 5 to 10 c.c. of the saline solution intra-arterially. With the exception of those animals in which the spinal

cord had been sectioned, all showed a marked rise in blood pressure. Similar dosage given intravenously had a vasodepressor effect. Even under anaesthesia the injections by either route resulted in muscular spasms and drastic purgative and diuretic effects, and the animal was harmed by their use. In cases of shock severe injury resulted and death appeared to be hastened rather than delayed.

D. D. O.

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["Cardiazol." HILDEBRANDT, F. (1938.) *Tierärztl. Rdsch.* **44.** 837-840.]

In 1925 Schmidt, Hildebrandt and Krehl isolated a new compound possessing many of the pharmacological properties of camphor with the added advantage of being soluble in water and rapidly absorbed from the alimentary tract. The substance has been called "cardiazol" and has proved of great value in the treatment of circulatory collapse, especially after the administration of anaesthetics. Thus the narcosis produced by avertin, chloral hydrate, medinal, etc., can be overcome by an intravenous injection of the drug. Overdosage with "cardiazol" produces not only a marked rise of blood pressure and rapid heart beat but also stimulation of the C.N.S., convulsions, etc. These may be overcome by light narcosis. "Cardiazol" acts directly on the vaso-motor centre and on the respiratory centre and unlike digitalis its effects are not cumulative. Doses suitable for animals are not given but it would appear that the therapeutic dose is much smaller than the toxic dose.

J. A. N.

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[A Case of Prontosil Poisoning in the Dog. (Trans. title.) RICHTER, R. (1938.) *Wien. tierärztl. Wschr.* **25.** 723-724.]

An eight months' springer spaniel bitch gained access to a packet of prontosil rubrum tablets and it is estimated that she ate ten tablets, receiving in all three grammes of prontosil.

The owner, returning home after an absence of two hours, found the dog staggering drunkenly, restless and whimpering. Seen by the author half an hour later, temperature was 102·0° F., pulse 100, strong and irregular; respirations were weak and accelerated with frequent slight coughing. The dog was restrained with difficulty, struggled to get free and walked with a staggering gait with intermittent tetanic spasms of the extremities.

An emetic produced a vomit consisting of red-coloured ingesta and faeces. Liquid paraffin was given to limit absorption.

Twenty-four hours later the dog had a normal temperature and was quieter, but there was inco-ordination of movement and spasm of facial muscles, the animal being unable to take a piece of sugar from the floor or the owner's hand.

Five days later inco-ordination was still evident, the hind legs were stiff and food was taken with difficulty.

Nine days elapsed from the time of ingestion of the tablets before the dog became normal again.

C. F.

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[Effect of Sulphanilamide upon the Viability of Meningococci in Spinal Fluid. NETER, E. *Proc. Soc. Exp. Biol. Med. N.Y.* **39.** 84-86. 1 tab. (18 refs.).]

Various authors have reported upon the curative value of sulphanilamide in meningococcal infections, but the mode of action of the drug is unknown. Experiments were performed, therefore, in an attempt to elucidate such action.

Spinal fluid from meningococcal meningitis was mixed with equal volumes of sulphanilamide in various concentrations and incubated at 37° C. After varying periods of incubation subcultures were made and the resulting growth of meningococci was noted.

It was found that the effect of the drug depends on its concentration and also on the time allowed for its action. The effect is not related to the presence or absence of leucocytes.

D. D. O.

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[Effect of Synthetic Male Hormone Substance on Descent of Testicles in Human Cryptorchidism. HAMILTON, J. B., HUBERT, G. *Proc. Soc. Exp. Biol. Med. N.Y.* **39.** 4-5. (5 refs.).]

Thirty-two cryptorchids received 5 to 20 mg. of testosterone propionate three to seven times weekly. Twelve cases were pseudocryptorchids, 20 true cryptorchids. Of the latter eight were bilateral and twelve unilateral. There was indication of endocrine abnormality in eight cases and familial endocrine disturbance in six cases. Total descent of the testes resulted in one out of nine unilateral cases and in three of the eight bilateral cases. Of the other bilateral cases unilateral descent occurred in two cases, partial descent in two cases, and the other case was a hypogonad whose testicles were later located in the scrotum. Surgical intervention showed that mechanical factors prevented descent in five unilateral and in two bilateral cases which had failed to respond to treatment.

In the twelve cases of pseudocryptorchidism small doses of the hormone were sufficient to condition the testes against spastic retention.

D. D. O.

[Acquired Tuberculosis in the Primate in Laboratories and Zoological Collections. Schroeder, C. R. *Amer. J. Pub. Hlth.* **28.** 469-475. (9 refs.).]

Of all primates which die in captivity 80 per cent. are victims of tuberculosis. The chief reasons for such an incidence are the poor sanitary arrangements usually in force in handling and shipping the animals, and their very low resistance to the disease. Very few monkeys show any allergic response to tuberculin tests, and for this reason it is difficult to detect early cases of disease. The subcutaneous test has given the most regular results, but it has obvious disadvantages. The weight curve represents an important diagnostic criterion in all acute forms, but is of less value in the young growing monkey. Radiography is of great value, but is usually too expensive.

Since it seems certain that nearly all infection is acquired between capture and delivery, methods of control should be concentrated on this period. Better shipping hygiene with improved final housing and avoidance of contact with open cases in primate or man are of prime importance if the incidence of the disease is to be lowered.

Deaths in young monkeys are usually found to be from the acute miliary form and generalised, with outstanding pulmonary lesions. Older monkeys show more extensive lesions with pulmonary caseation and cavitation, and caseous lesions in spleen, lymph nodes, and liver. Meningitis, bone involvement, and serositis are rarely seen.

D. D. O.

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[Histological Studies on Fowl Paralysis. (Trans. title.) Potel. (1938.) *Z. InfektKr. Haustiere.* **54.** 143-154.]

The article deals with the histological examination of the nerves and important organs of 32 fowls which had shown clinical evidence of fowl paralysis. In all, macroscopic changes were found in the nerves of 21 and various organs of eleven of the 32 fowls. A full description of the types and origin of the infiltrating cells is given and it is stated that, generally speaking, the same types of cells are found in the lesions of the nerves and the various organs. The cellular reaction is not regarded as representative of an inflammatory reaction nor was any evidence found of degenerative processes which follow a reaction inflammation due to a local injury. No evidence could be found in the perivascular tissue nor in the blood vessels of cells regarded as inflammatory in character. The cells were mainly lymphocytes and lymphoblasts though other types were also present, especially eosinophilic leucocytes which are said to have arisen from adventitious tissue cells and may even be altered lymphocytes. Oedema in the nerves is stated to be due to blockage of the local course of the blood from the masses of cell infiltration. It is concluded that fowl paralysis is not a polyneuritis nor a neuromyelitis but is a form of fowl leucosis and should be referred to as neuro-lymphomatosis gallinarum.

F. B.

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[Changes in the Genitalia of the Cow in Pregnancy. (Trans. title.) Richter. (1939.) *Deuts. tierärztl. W'schr.* 5. 67-70.]

As pregnancy progresses and the foetus increases in size the position of the cervix alters. From an initial position on the ventral aspect of the vagina pointing slightly downwards it assumes a more horizontal position, rising slightly and later changing again so that the os is pointing upwards. The vaginal passage tends to lengthen. These changes, attributed to the increasing traction of the growing foetus in the womb, tend to be reversed from the fifth month onwards, when the uterus fills more of the upper posterior abdominal space. Tension is relaxed and the cervix assumes a more horizontal position again.

Richter was able to take measurements and make an histological examination of 25 cows killed between the sixth week and the end of gestation. Up to the seventh month there is a steady increase in the muscular tissue of the uterus but at this time a loosening of the fibres can be observed and some degree of oedema can be seen. Changes in the cervix can also be detected histologically.

The uterus may increase to more than 20 lb. in weight during any one pregnancy but the horn which was gravid never returns to its original weight but remains larger.

Much information is given as to the thickness of the different parts of the genital tract at different stages of pregnancy and histological points are well illustrated.

N. S. B.

THE ROYAL AGRICULTURAL SOCIETY

At the recent annual general meeting of the Royal Agricultural Society of England, Mr. John Evens, for 57 years a member of the Lincolnshire Agricultural Society and one of the original founders of the Lincolnshire Red Shorthorn Association, was elected president for 1940. Lord Athlone (in the chair) announced a profit of over £1,000 from the Royal Centenary Show in Windsor Great Park. Sir George Stapledon, Director of the Welsh Plant Breeding Station at Aberystwyth, was presented with the Society's gold medal and certificate of honorary membership for distinguished services to agriculture.

REPORT

[**New Zealand:** Annual Report of the Department of Agriculture, 1938-39.]

The most significant feature of this interesting report, as far as our profession is concerned, is an account of the establishment of a new division of the Department, called the Animal Research Division, which, in the words of the Minister for Agriculture, is "to co-ordinate the whole of the animal-research work conducted by the Department and to act in co-operation with other institutions." It is estimated that during the current financial year approximately £60,000 will be spent in prosecuting research into animal diseases and kindred subjects. New laboratories are being built for the purpose and the staff at the time of reporting consisted of 12 veterinarians and 29 other technical officers. The staff is still short of a number of specialists, particularly in genetics, parasitology and pathology, but it represents a team of workers under one control which should give great service to the country. In addition it has the advantage of assistance from the livestock and fields divisions of the Department. A full programme of work is already under way, and although many of the more serious animal problems in the country are under investigation elsewhere, it is felt that reliance is best placed on results obtained by local investigation. The problems receiving immediate attention are: facial eczema, sterility, artificial insemination, mastitis, sheep mortality and nutritional complaints of cattle and pigs. The existing veterinary laboratory at Wallaceville, where much useful work has been carried out in the past, is being absorbed in the new project, as is the Ruakura State Farm and the chemical section of the Department.

The work of this new division will be followed with interest by veterinarians throughout the world and we expect to get considerable information from a team of this composition and magnitude.

Another division of the Department which interests us is the livestock division, whose Director is a member of our own College (Mr. W. C. Barry, M.R.C.V.S.) and whose report contains a considerable amount of interesting data about livestock diseases and the manner in which these are dealt with. In addition to disease control this division deals with animal husbandry, dairy inspection, meat inspection, control of imports and exports of livestock and their products, the rabbit nuisance and noxious weeds. In consequence of such wide responsibilities this division must hold considerable influence in the agricultural policy of the Government, and it is pleasing to note that our profession is thus honoured by the duty of carrying out such work of great national importance.

Reference must also be made to the report of Dr. Hopkirk, officer in charge of the veterinary laboratory, since it contains a host of interesting observations on experiments conducted during the year on such complaints as mastitis, sterility, facial eczema of sheep, enterotoxaemia, enzoötic icterus and poultry diseases. Space does not allow us to abstract any of these observations and we would strongly advise perusal of the report by our colleagues who are working on these disorders at home and particularly those engaged in mastitis control.

W. K.

HORSES FOR THE ARMY:
REGISTER OF OWNERS AND DEALERS

An announcement made by the War Office at the end of last week states that registers of horse owners and horse dealers are being prepared and that owners of horses of certain types and specifications are invited to communicate with the Under-Secretary of State (Q.M.G.4), the War Office, London, S.W.1, with a view to their names and addresses being registered, together with the number and particulars of any suitable animals they may wish to offer for disposal for Army purposes.

The announcement continues: "A separate register will be made for dealers, who should state, when registering, the number of suitable horses they have on their hands at present, and the numbers they would be likely to be able to supply. Such registration does not entail any obligation by the War Office to purchase the animals registered, nor any obligation on the part of the owners to retain any animal so registered for War Department purposes. All horses may be required after purchase for service with any of the Allied Armies, and no guarantee regarding the ultimate disposal of horses passing into the hands of an Allied Government can be given. All animals to be purchased will be inspected by an officer of the War Department, and will be required to pass the usual veterinary examination before the purchase is completed.

"Owners of animals, once having registered, should at once inform the War Office as to any casualty to, or the non-availability of, any animal registered.

"Specifications of animals that may be required are as follows:—

Cavalry Trooper.—Horses of the hunter type, between the ages of five and ten years, and from 15·1 to 16 hands in height. Deep bodied, with short back, well sprung ribs, with substance, quality, and true action. The maximum price to be paid is £60.

Light Draught.—Active light vanner type, between the ages of five and ten years, and from 15·1½ to 15·3 hands in height. Strong quarters, plenty of bone, and true action, and capable of pulling a big weight over rough or broken ground. The maximum price to be paid is £60.

"After acknowledgment of registration, notification of inspections with a view to purchase will be made by notices in the Press. It will be unnecessary for any further communications to be forwarded to the War Office."

REVIEW

[Kenya Chronicles. By Lord Cranworth. Macmillan. 1939. 16s.]

Though this autobiography is a good one and warmly to be recommended to the general reader, it would hardly come under review by such an organ as the *Veterinary Record* were it not that it contains numerous warm tributes to the gallantry and professional skill of a distinguished member of our profession, Colonel Robert J. Stordy, C.B.E., D.S.O., whose work in Africa has never in our estimation been properly appreciated outside the ranks of a narrow official circle. This volume to some extent fills this gap. Lord Cranworth sums up his own feelings in the matter in the following tribute: "Kenya during this decade was singularly fortunate in its type of Civil Servant, but she was never served more loyally, or in his own sphere by a better man than Robert Stordy."

While it is true that during the last few years works of fiction have appeared in which the veterinary surgeon has received just and understanding treatment, on the whole his literary appearances have been few, and not always creditable to a learned profession. Such tributes as are contained in this work are therefore worthy of note, as an indication of the growing public recognition of our difficult and many-sided calling.

The journey that Colonel Stordy took with the author in 1910 from Kenya to Addis Ababa is recorded in chapters 5 and 6. This is the high light of the book, and deserves a volume to itself. As it is stated that the account is based on Colonel Stordy's diary kept at the time, we trust it is not too much to hope that this may yet be accomplished. If so, let the modesty and reticence that characterise men of this calibre be reduced to a minimum, when the story comes to appear in print. It is a pity the price of "Kenya Chronicles" has been fixed so high, for such a tale of courage and brave endeavour, informed by the highest type of patriotism, should be made available to a large circle in days such as these in which we now live.

A group of pedigree utility poultry breeders met in London recently to consider how they could assist the Government in conserving supplies of foodstuffs and at the same time maintain the stocks to provide pullets of the most economical type during the war, and for development on a sound foundation at a later date. It was emphasised that only pullets bred from stock of proved laying capacity should be kept, and that both the poultry industry and the nation would derive advantage from a campaign for the survival of the fittest production stock in the country.

ROYAL COLLEGE OF VETERINARY SURGEONS

Membership Examinations, December, 1939

LIST OF SUCCESSFUL CANDIDATES

London

First Year:

Carter, C. R.	Sewell, P. W. (C)
Clover, R. H.	Shuja, J. D.
Macqueen, J. M.	

(C) Denotes credit in Chemistry, etc.

Second Year:

Ayliffe, A. R.	Nye, S. S. (P)
Berry, M. H.	Ogle, R. G.
Cobbett, B. H.	Pybus, J. S.
Dickinson, G.	Sandercock, R. F. G.
Drury, K. W. G.	Shollick, Miss G. W.
Gibbs, W. A.	Thompson, I. K.
Hill, R. B. D.	Thompson, S. H.
Hills, J. N. M.	Varnbriksha, S.
Matthews, A. C.	Waterman, J. F.

(P) Denotes credit in Physiology, etc.

Third Year:

Bagenal, B.	Rand, Maurice
Buxton, A.	Reynolds, Miss P. M.
Canti, J. A.	Roberts, E. J.
Chaudhari, C. P.	Scott, D. J. P. (P)
Dobinson, J. (P) (H)	Sheriff, D.
Dyke, J. (P) (A)	Sindrey, R. J.
Geffen, L. R.	Sparrow, L. H.
Hesketh, W. C.	Townson, R. S.
Newhook, J. C.	Turner, R. J.
Pilgrim, E. G.	Weatherhead, G. C. (A)

(P) Denotes credit in Pharmacology.
(A) Denotes credit in Anatomy.
(H) Denotes credit in Hygiene.

Fourth Year:

Barnard, G. M.	Lawfield, F. G.
Baxter, Miss K. A.	Moore, Miss D. M.
Beament, R. A.	Morgan, K. U.
Buckner, D. R. P.	Patterson, J. R.
Clarke, E. V.	Rudland, G. A. H.
Darne, A. (Paras)	Stewart, Miss B. M.
Huckle, Miss B. M.	Thomas, T. I.
Jonas, A. C.	Walker, R. J. C.
Jones, Miss K. M.	

(Paras) Denotes credit in Parasitology.

Fifth Year (Final):

Biddis, K. J.	Moldawsky, A.
Boden, K. A.	Moon, G. J. H. (M)
Bowett, J.	Nixon, George
Dickson, S. J.	Ricks, Miss O. W.
Gardner, J. C.	Soothill, P. L.
Good, F. D. T.	Sparke, D. J.
Heath, P. T.	Sprent, J. A. F.
Johnson, S. P. L.	Sutton, Mrs. H. F.
Khan, M. H.	Temple, R. R.
Maillard, Miss M. O. E.	Weedon, D. A. J.

(M) Denotes credit in Medicine.

(To be continued)

University of Liverpool Examination List

Following is the December, 1939, Examination List of the University of Liverpool School of Veterinary Science.

DEGREE OF B.V.Sc.

FINAL EXAMINATION.—*Part I.*—Arthur, G. H., *Dalby, Mary, Hanbury, D. G., Sutton, D. O.; *Part II.*—Arthur, G. H., Dalby, Mary, Hanbury, D. G., Sutton, D. O.

FOURTH EXAMINATION.—Donnelly, J. F., Shaw, G. D.

THIRD EXAMINATION.—*Part I.*—Barber-Lomax, J. W., Bee, B. R., Clay, H. A., Coates, P. D. L., Edwards, C. M., Foster, J. L., Gibson, T. E., Hopkins, C. D., Jones, D. K., Mahmoud, A. H., Pickin, W., Shaw, I. G., Stabler, A. B. O., Wilson, A. A.; *Part II.*—Barber-Lomax, J. W.; *Part III.*—Barber-Lomax, J. W., Hopkins, C. D., McLaren, I. S., Shaw, I. G., Stabler, A. B. O.

*Distinction in Veterinary Medicine.

SECOND EXAMINATION.—Bolton, J. F., Boundy, T., *Carlyle, A., Dugdill, R. S., Griffiths, R. B., Hargreaves, P. R., Jones, E. B., Jones, J., Jones, W. M., Jubb, Sylvia, C., Kerr, P. A., McCreanor, Mary, McLennan, I. S., Richards, R. A., Rimmer, B., Unsworth, K., Wynne, M.

*Distinction in Physiology (including Histology) and Biochemistry.

GENERAL MEDICAL COUNCIL

Mr. H. L. Eason, C.B., C.M.G., M.D., M.S., Principal of London University, was elected president of the General Medical Council at the opening meeting of the 150th session on November 28th.

Sir Norman Walker, the retiring president, in his address, said that the Council realised that the importance of maintaining due provision for study and proper requirements for qualification was enhanced rather than diminished in time of war. Arrangements had been made to avert a repetition of the confusion caused 25 years ago by the rush of students to enlist. The Council's attitude to the medical curriculum and examinations would be that of 1914. The executive committee had already formulated recommendations for the guidance of the licensing bodies, and these represented in general terms the minimum curriculum which should be required. Cases might arise during the national emergency in which the bodies would deem it expedient to modify or suspend the application of their requirements for particular candidates, but the Council expected that all such cases should be duly recorded and reported to the Council in the usual way. Licensing bodies dealing with applications by such candidates would recognise the importance in the public interest of maintaining unimpaired the standard of knowledge and skill required of a general practitioner. They would agree with the Council that in every instance the requirements of the minimum curriculum should be substantially fulfilled.

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are mainly concerned with ploughing and cultivations. As regards the second part of the question, the appointment of sub-committees to deal with certain sections of work is primarily a matter for the county committees themselves, and I am advised that no committee has as yet found it necessary to set up a poultry sub-committee.

In Parliament

The following are among the questions and answers recorded in the House of Commons recently:—

ANIMAL FEEDING-STUFFS SUPPLIES

Mr. W. ROBERTS asked the Minister of Agriculture whether, in view of the shortage of animal feeding-stuffs, he will make arrangements that every farmer should register with a feeding-stuff merchant and purchase from him alone, in order that an equitable distribution of available supplies should be assured?

Sir W. WOMERSLEY: My right hon. Friend does not consider that the adoption of the suggestion made by the hon. Member would in itself solve the difficulty to which he refers. The question of what action might be taken to ensure a more equitable distribution of the available supplies of feeding-stuffs is now being examined by the Departments concerned.

Mr. DE LA BERE asked the Chancellor of the Duchy of Lancaster whether the Government will take steps to include the so-called balanced rations for cattle under the Maximum Prices Order?

Mr. W. S. MORRISON: These rations are evened by Section 2 (b) of the Feeding Stuffs (Maximum Prices) Order.

Mr. DE LA BERE: Is my right hon. Friend aware that these compound mixtures are not so successful as raw materials; and does he not realise that if they are not balanced and not economic, it would be better to do away with them altogether?

Mr. MORRISON: That is another question.

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LIVESTOCK (SLAUGHTER)

Rear-Admiral BEAMISH asked the Minister of Agriculture whether he is aware that, owing to the virtual cessation of imports of cattle from Canada, and the restriction of cattle imports from Ireland, there is an increasing tendency to sell cows and heifers for slaughter; and whether, in view of the importance of maintaining at as high a level as possible the milk supplies of this country, he can now state what action he proposes to take to ensure the maintenance of this output?

THE MINISTER OF AGRICULTURE (Colonel Sir Reginald Dorman-Smith): I am aware that imports of cattle from Canada have been light throughout the current year, but the total number of cattle imported from Eire during the first ten months of 1939 has increased compared with last year, and there was no diminution in normal arrivals in September and October. A few weeks ago there was a tendency to sell for slaughter increased numbers of cows, but more recently this trend has been reversed. The position is being closely watched.

POULTRY INDUSTRY

Mr. LESLIE BOYCE asked the Minister of Agriculture whether any representatives of the poultry industry, as such, have been appointed members of the county war emergency committees; and whether there are any poultry sub-committees of the county war emergency committees?

Sir R. DORMAN-SMITH: No representatives of the poultry industry as such have been appointed to the county war agricultural executive committees which, as my hon. Friend will be aware,

Notes and News

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

Dec. 18th.—Meeting of the Editorial Committee, N.V.M.A., at 36, Gordon Square, W.C.1, 4 p.m.

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N.A.R.P.A.C. CHIEF EXECUTIVE OFFICER'S TOUR IN NORTH-WEST ENGLAND

In our issues of October 21st and November 18th we recorded the visits paid by the Chief Executive Officer to certain areas in the Midlands, in the South-East and in Scotland in which the N.A.R.P.A.C. organisation is functioning. Colonel Stordy has since completed a tour in Lancashire and Cheshire, visiting Lancaster and Morecambe (Mr. G. C. Webster in charge), Liverpool and Wallasey (Major H. Sumner), Birkenhead and Bootle (Mr. N. M. Clayton), Warrington (Mr. H. H. Ferguson) and Manchester (Mr. W. K. Johnstone). Again satisfactory progress of active operations in connection with N.A.R.P.A.C. has to be recorded, but the area is such a large one that Colonel Stordy hopes to pay a return visit and to make a more extended tour.

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In the report of the proceedings of the Central Veterinary Society, appearing in our last issue, the President of that Society asserted that the Chief Executive Officer was in receipt of an honorarium from N.A.R.P.A.C. As many of our readers already will be aware, N.A.R.P.A.C. did offer an honorarium to the Chief Executive Officer, but Colonel Stordy, on reflection, decided that he would prefer to be on the same basis as the County, Regional and Divisional Veterinary Officers, who are rendering such valuable assistance in a voluntary capacity.

We regret that this was not made clear in our last issue, and tender our apologies to Colonel Stordy for any misapprehension thereby created in the minds of our readers in the absence of any reference to his generous gesture.

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PERSONAL

Veterinarian's South African Post. — Major Adrian Morrison Howie, O.B.E. (Military Division), M.R.C.V.S., son of Mr. and Mrs. T. J. Howie, Arbroath, at present Veterinary Officer at Cape Town in the Union Government of South Africa, has been appointed Officer Commanding the Veterinary Services at Pretoria in connection with the Permanent Defence Forces.

Recording the above appointment, the *Dundee Courier* adds: "Major Howie has resided in various parts of Africa in connection with his duties as Government Veterinary Officer. During the war of 1914-1918 he was, as captain, engaged with the mobile sections in German South-West and German East campaigns under Generals Botha, Smuts, and De Venteer, and was four times mentioned in despatches. After cessation of hostilities in German East he came home in the Kenilworth Castle, which was torpedoed in the Channel, but fortunately without loss of life to any on board. Going to the War Office he was appointed Embarkation Officer at Southampton for the horses and mules destined for the forces in France, and in 1920 received his O.B.E. (Military) distinction from the King. Shortly thereafter he returned to the Cape in the Llanstephen Castle, and resumed his duties in the South African Government Veterinary Department."

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Birth.—Turney.—On December 8th, at Fairlawn, Trull, Taunton, to Verena, wife of John T. Turney, the gift of a son.

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Colonial Veterinary Service Appointment.—Mr. R. S. T. Bowden, M.R.C.V.S., has been appointed in the Colonial Veterinary Service as Veterinary Officer, Malaya.

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R.C.V.S. OBITUARY

Healy, Joseph, 70 Lowbourne, Melksham, Wilts. Graduated London, July 5th, 1887. Died November 30th, 1939; aged 78 years.

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LEGAL NOTES

Anthrax-infected Beasts. — At Grantham on November 27th, Benjamin Storer, farmer, of Sedgebrook, was fined a total of £20, with £10 costs, for four breaches of the Diseases of Animals Act, and Percival H. W. Pride, of Whatton-in-the-Vale, Notts, and his son, Arthur E. Pride, of Aslockton, Notts, butchers, were fined £5 each, with £7 10s. costs each, for carrying a diseased carcase on the highway.

Storer pleaded guilty, but the Prides pleaded not guilty and gave notice of appeal on conviction.

The case for the prosecution was that in September last Storer had an outbreak of anthrax on his farm, losing six beasts, and Storer himself and his cowman became affected with the disease. Before calling in a veterinary surgeon or notifying the authorities, Storer communicated with the Prides, who removed the carcases of two beasts to their slaughterhouse, where one was cut up into joints as if for human consumption, and the other opened. The carcases were seized and destroyed.

In defence, the Prides said they removed the carcases to their premises for examination on instructions received from Storer. They had not had any previous experience of anthrax, and to them the flesh of the animals seemed to be perfectly good. They would not have sold any of it for human consumption until it had been passed by the local food inspector. They had asked the latter to call and see it, but before he could do so it had passed out of their hands.

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MINISTRY OF AGRICULTURE NEWS SERVICE ITEMS

The Ministry of Agriculture News Bulletin for December 5th contains the information that arrangements for the control of livestock marketing, including purchase of stock by the Ministry of Food and for controlling the distribution of home-killed meat, have been under close examination and certain adjustments are being made which will take some weeks to complete. It is proposed to postpone introduction of control until the New Year, since the Government do not consider it is desirable to introduce control during the period of the Christmas trade. It was recognised by Government that the present system of partial control under the Maximum Prices Orders (designed as an interim measure) was giving rise to increasing difficulties in the marketing of fat stock. Consequently, and since supplies of meat expected for the Christmas season are adequate, restrictions on marketing and the control of prices of fat stock (including pigs) were removed on December 1st. Full control will be established on a date to be announced later. The decision applies to both wholesale and retail prices.

Before full control is introduced, appropriate adjustments in the schedule of initial prices to be paid for fat stock, as published, will be made after consultation with producers' organisations. The revised schedule will take account of seasonal trends and other relevant factors.

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VIRUSES AND CANCER

In an editorial article on the above subject appearing in the issue (November 11th) from which we reproduced, last week, Dr. Andrewes's presidential address (to the Section of Comparative Medicine of the Royal Society of Medicine) on "Latent Virus Infections: Their Possible Relevance to the Cancer Problem," the *British Medical Journal* observes:—

"Speculation is an exercise for which there is no more fruitful field in the whole of pathology than that of virus diseases. The filterable virus itself is something which leaves a good deal of scope for the imagination; its presence and its properties can often be deduced only by indirect methods difficult of application and of no more than approximate accuracy. Although there is much which remains uncertain about viruses as a whole, including even their essential nature, they become problematic in the highest degree when they are considered as causes of cancer. Nevertheless, in spite of numerous difficulties and of gaps in the facts of the argument which can only be bridged by analogy or conjecture, an hypothesis has been built up which regards malignant disease as due directly to the presence of a virus and relegates all other known causes—notably various well-authenticated carcinogenic 'irritants'—to the position of merely predisposing agents. One of the leading advocates of this bold and far-reaching idea is Dr. C. H. Andrewes, whose presidential address to the Section of Comparative Medicine of the Royal Society of Medicine deals with what is perhaps its most difficult aspect. The general virus hypothesis of cancer makes it necessary to assume that the virus is latent in the body, presumably for a long period and possibly throughout life, until its cancer-producing power is set free by some other, possibly chemical, stimulus. It is therefore appropriate to inquire whether other and less hypothetical viruses are known to behave similarly. A full answer to this question is given in the first part of Dr. Andrewes's address. There are indeed many viruses which behave somewhat similarly. The viruses of influenza and poliomyelitis can infect and immunise without producing manifest disease; those of poliomyelitis, fowl-pox, and possibly others persist in the body after recovery from an attack. Still more apposite is the behaviour of two viruses in a third category, since, like the hypothetical cancer virus, they remain latent in the body without inducing full immunity. The first, the virus of herpes simplex, commonly exists in the mouth; occasionally, as was pointed out by Dr. G. M. Findlay at last week's meeting, it exists in other parts of the body, and attacks the tissues only when their resistance is diminished by other causes. The second, virus iii, is believed to be exclusively latent under natural conditions, and can only be brought into activity by successive injections of tissue suspension from one rabbit to another. That viruses can remain latent for long periods is unquestionable; on the other hand, latency is most often seen in the immune individual, and there is certainly no known example of it in which, so far from immunising, it terminates in a steadily progressive infection.

"No observations made in recent years have had a more startling effect in the field of cancer research than those of Bittner, which can be used as another item in this argument. Susceptibility to cancer of the mamma in mice, previously thought to be an inborn character, must now be regarded as due to something transmitted from mother to offspring after birth. Of the three things which, according to Bittner himself, this something may be, a virus is certainly the most credible, and most people will share Dr. Andrewes's difficulty in 'swallowing a hormone which when taken in infancy will condemn your grandchildren to the development of cancer in their years of maturity.' But in spite of suggestive collateral evidence, of which this is an example, it is difficult to get over the solid fact that the presence of a virus cannot be demonstrated in malignant mammalian tumours, whether naturally occurring or chemically induced—at least by those direct methods which serve to demonstrate its presence in tumours of birds. For this formidable difficulty Dr. Andrewes suggests a new explanation, which is both ingenious in conception and picturesque in his elaboration of it. The idea of a 'toothless' virus, so happily established in the cells of one individual that it loses its capacity to bite those of another, will serve as an hypothesis until facts are forthcoming either to support or to condemn it. It may be observed in passing that among bacteria enhanced pathogenic activity in one host is usually accompanied by an increase in capacity to attack others and not a diminution, but the metabolic habits of bacteria and viruses

are so different that this comparison may be invalid.

"It is not easy to see how the present methods of approach are going to carry this problem much further. Hitherto the study of viruses has proceeded mainly on lines which were first found useful in dealing with bacteria, and where all others have failed the serological method has had to be relied on to yield results unattainable by other means. Any doubts of the specificity of some of the immune reactions observed would seriously imperil the conclusions which have been drawn from existing data. Can the study of this subject only be pursued by adapting to it the methods of bacteriology? Just as viruses differ fundamentally from bacteria, so perhaps do the most instructive methods of studying them. It is difficult to escape the feeling that something is lacking in this obscure subject, and that more of the concrete and less of the abstract and conjectural will only be produced by some altogether new line of attack. That the virus hypothesis of cancer in general is unsatisfying to some minds is due both to this essential uncertainty and to the number of questions which in its present form it leaves without an answer. Let us consider a few of these. Is the cancer virus omnipresent in the human race, or, if not, how and when does the individual acquire it? What is its distribution in the body, and does this vary? Does it ever act in man as the sole cause of malignant disease, or is there always a predisposing cause in addition? Does the body ever develop an immunity to it, and is there one such virus or are there many? Until such questions as these can be answered this hypothesis can have no force or practical interest, and they are not likely to be answered until a means is found of bringing the ordinary run of mammalian cancers within the scope of study from the virus standpoint."

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CHEMICAL AGENTS AND VIRUSES IN CANCER

We reproduce from the *British Medical Journal* the following leading article, headed as above and published in the issue of that journal of September 23rd, which presents a condensed review of several important papers on cancer.

There are two types of agent—chemical and microbic—which are known to be capable of inducing malignant growth, and can be made to do so at will in the experimental animal. Various chemical stimuli cause cancer, particularly of industrial types, in man, and tar or its active constituents will regularly produce it in animals. Cancer of microbic origin—if it be granted that filterable viruses are micro-organisms—is exemplified clearly only in certain naturally occurring tumours in birds, which can regularly or frequently be reproduced by inoculation with a cell-free filtrate of tumour substance. At first sight these would appear to be utterly distinct and unrelated modes of carcinogenesis, implying that malignant growth can arise in more than one way. Nevertheless some of the greatest authorities in this field are unwilling to accept this interpretation, and the belief has been gaining ground that all malignant tumours in whatever animal species owe their continued activity to the presence of a virus, the original chemical stimulus (where such a factor is known to have been at work) being merely a predisposing cause. It should be understood that so far as human cancer is concerned, and indeed all mammalian cancer, with very few exceptions of doubtful significance, this is only a hypothesis unsupported by any direct evidence. A review of the work in this field may help to a clearer understanding of the issues involved.

In 1910 Rous described a transplantable sarcoma of a domestic fowl and found, later, that it was transmissible by an agent separable from the tumour cells. Subsequently many other filterable sarcomata were found in fowls. The broad result of the study of these tumours was the demonstration that they combined the essential properties of mammalian tumours with the distinctive property of being transmissible by agents which resembled filterable viruses. Many students of cancer adopted the view that sarcomata in fowls were produced by viruses in much the same way as tumours in mice were by tar or carcinogenic hydrocarbons, but they considered that viruses were not the cause of mammalian tumours because the latter were not filterable. Gye and others maintained that non-filterability was no proof of the absence of a virus and, further, that the fowl tumour agents differed from all other carcinogenic agents, since they gave rise to growths identical with those from which they were derived and in doing so were multiplied. The controversy entered a new phase in 1933-34 with reports of the cell-free transmission of sarcomata induced in fowls by tar and the production of tumours in rabbits by the Shope papilloma virus. Several investigators stimulated the formation of sarcomata in fowls by injections of tar or of carcinogenic hydrocarbons, but could not transmit them by filtrates. McIntosh,[1] however, reported that he had transplanted five sarcomata induced by tar and transmitted three of them by cell-free filtrates. Recently he and Selbie[2] have described five more tar sarcomata; four were transmitted by tumour emulsions and two of these by filtrates. McIntosh and Selbie conclude that active virus can be demonstrated in a large proportion of chemically induced tumours and that tar-induced sarcomata of fowls are virus tumours. They suggest that the failure of others to transmit induced tumours may be attributable to differences in technique or to chance, since all induced tumours do not behave alike and relatively few have been studied. They suggest, further, that the consistent inactivity of filtrates of a few induced tumours which have been transmitted for considerable periods by grafts may be due to variation in the relation of the virus to the tumour cells, to a decrease of virulence, to the presence of an inhibitory substance, or to the virus being too large to pass through the filters. Andrewes[3] and Foulds,[4] using serological methods, found evidence that an antigenic component similar to the infective agent of Rous sarcoma was present in two tumours which never yielded active filtrates.

Rous and Beard published a preliminary account of observations on the Shope rabbit papilloma in 1934 and Rous[5] summarised the early work in 1936. The main features are as follows. Cutaneous papillomata are endemic among cottontail rabbits in certain parts of the United States, and Shope found that they were

[1] *Brit. J. exp. Path.*, 1933, **14**, 422.
[2] *Ibid.*, 1939, **20**, 49.
[3] *J. Path. Bact.*, 1936, **43**, 23.
[4] *Amer. J. Cancer*, 1937, **31**, 404.
[5] *Ibid.*, 1936, **28**, 233.

transmitted by a filterable virus. The virus gave rise to similar but not identical tumours in domestic rabbits; usually virus was not recoverable from these papillomata, although there was serological evidence for its existence. Rous and his colleagues made autologous grafts of papilloma tissue into muscles and internal organs. The resulting growths had strong histological resemblances to malignant tumours. The virus infected only epidermal cells and the progress of the papillomata was modified to some extent by various procedures. Eventually papillomata on domestic rabbits developed into undoubted carcinomata which metastasised and killed their hosts; papillomata on cottontail rabbits rarely became malignant. Virus was not recovered from the carcinomata, though serological evidence in favour of its presence was obtained. The papillomata developing on normal scarified skin were benign tumours remarkably uniform in type; they grew for many months before malignant characteristics were apparent. Rous and Kidd[6] then found that virus injected intravenously often localised in rabbits' ears which had been repeatedly tarred and produced a variety of benign papillomata and carcinomata differing from the ordinary. The distinctive peculiarities of these anomalous tumours were noted at their first appearance; continued tarring stimulated the growth of the tumours and accentuated the anaplasia of the malignant ones, but it did not hasten the change of papillomata into carcinomata. Virus localising in skin which had been tarred for short periods gave rise to papillomata of the ordinary type. Some preparatory change in the epidermal cells was essential for the development of the anomalous tumours, and as a rule it was not accomplished until the skin had been tarred to almost the extent necessary for initiating tar warts in some of the rabbits. Lacassagne and Nyka[7] obtained similar results by using benzpyrene instead of tar, and somewhat similar observations, as yet unconfirmed, were reported by Andrewes, Ahlstrom, Foulds, and Gye.[8] Two sarcomata were induced by the injection of Shope fibroma virus into rabbits which had received intramuscular injections of tar. One sarcoma was transplanted, but no evidence of the persistence of virus was obtained. In normal rabbits the fibroma virus causes fibromatous lesions which invariably regress.

Recent researches, therefore, focus attention on the possibility of a co-operation between viruses and chemical agents in the origin of tumours. It is conceivable that mammalian tumours contain agents which cannot transform normal tissues into tumours but which might transform tissues altered by carcinogenic agents. Woglom,[9] who investigated this possibility, injected preparations of the transplantable mouse tumour 37S into mice which had been painted with benzpyrene but observed no modification of the benzpyrene lesions, so that no extracellular agent was demonstrated by the method used. Woglom's experiment is open to criticism, for it is improbable that epithelial lesions of the skin are appropriate for detecting an agent from a tumour which, in the general view, is a sarcoma. Moreover, the experiment would probably fail if repeated with Shope tumours in domestic rabbits; the papilloma virus certainly originates the tumours but is not recoverable from them. The failure to demonstrate a virus does not prove its absence; so much is sure, but those who believe that all mammalian tumours are caused by viruses must bear the onus of proof. Meanwhile, it is reasonable to accept Woglom's view that the established facts "justify the continued search for an extracellular aetiological agent in mammalian new growths as fresh methods of investigation present themselves."

[6] *Science*, 1936, **83**, 468; *J. exp. Med.*, 1938, **68**, 529.
[7] *Bull. Ass. franç. Cancer*, 1937, **26**, 154.
[8] *Lancet*, 1937, **2**, 893.
[9] *Amer. J. Cancer*, 1939, **35**, 374.

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ANTISEPTICS AND CHEMOTHERAPY

Discussing chemotherapy in relation to mouth lesions, at a meeting of the Section of Odontology of the Royal Society of Medicine, Professor A. Fleming, of St. Mary's Hospital, first pointed out (says the *Pharmaceutical Journal*) that in the mouth there are naturally occurring antibacterial substances, and when chemical antiseptics are used the action of these on the natural antiseptics should be appreciated. Certain important points in treatment with sulphonamide drugs had to be borne in mind. In the first place, these drugs had a remarkable action on some bacteria and were without effect on others. On a large number, even of the most sensitive bacteria, they had little or no anti-bacterial effect. Another point was that large numbers of bacteria or peptones would inhibit the anti-bacterial action of the sulphonamide compounds. The chief action of these drugs was not that of killing the organisms but of delaying their growth; the destruction of the bacteria had to be completed by the natural defence mechanism of the body.

The action of these drugs, Professor Fleming continued, would be most dramatic when the infection was by such a microbe as the haemolytic streptococcus and when there was no marked localisation of the infection. When there was such a localised infection, and more especially when there was an abscess, such dramatic effect must not be expected. In such cases the number of bacteria was likely to be great, and in an abscess tryptic ferments would be liberated from degenerated leucocytes, with the consequent production of peptone, which was strongly inhibitory to sulphonamide action. As the body has to complete the destruction of the infecting bacteria, it was clear that better results would be obtained when the natural defences were as efficient as possible. Immunity could be raised either by a passive measure—that is, the administration of serum—or an active one—that is, vaccines. Not many serums which would have an antibacterial action on the microbes of the mouth were available for dental practice, but a vaccine could be made with great ease. By making an autogenous vaccine the patient could be immunised up to a point which made the administration of the drug more effective.

Professor Fleming thought that sulphonamide drugs might be of great importance in war. Surgeons had been afraid to excise wounds infected with haemolytic streptococci because of the danger of invasion of fresh tissues by the streptococcus and consequent septicaemia. But now sulphanilamide or M & B 693 could be administered to the patient so as to get a good concentration in his blood, and the surgeon could then excise the wound without danger of the infection spreading.

THE PARROT FAMILY IN CAPTIVITY

"The distribution of the parrot family in captivity has been going through remarkable changes in the last ten years," writes *The Times* special Zoo correspondent in last Saturday's issue of that paper, who proceeds: "The psittacosis regulations have effectively prevented the import of such birds except by those societies (notably the London Zoological) which have been granted special privileges. And now that the war has come such restricted imports have stopped. These factors, of course, accentuate the unique position occupied by the magnificent collection at the Zoo. Even now the Society possesses about 600 parrots, parakeets, macaws, and cockatoos, belonging to well over 200 different species; and there can be no doubt that it is the finest collection of living parrots in the British Empire and probably in the world. In these times the Society will have to guard this important treasure very carefully. Though the supply of parrots, for the reasons outlined, has been very heavily restricted, the demand for them still continues, and dealers and pet shops all over London are offering quite large sums on behalf of clients even for such common creatures as African greys and blue-fronted Amazons. The fact that there are so many of them still alive in this country is due to the great longevity of this order of birds. Though there have been many exaggerations of the length of life to which parrots live, there are authentic and well-documented instances of individuals having lived for well over 60 years, and sometimes up to 75.

Popularity of the Budgerigar

"Those who are interested in the parrot fancy have had to adjust their policy considerably. There has, rather naturally, been a strong recent tendency to concentrate on breeding birds—particularly the parakeets, love-birds, and the universally popular budgerigar. Indeed, the budgerigar can quite properly be described as the only new domestic pet of the twentieth century. It is quite probable that there are three or four million budgerigars alive in this country to-day, and that there are actually more of them than of any species of wild bird. Careful estimates of the wild-bird population of Britain lead us to believe that the commonest, the blackbird and the chaffinch, can muster at the most about 3,000,000 breeding individuals each May.

"Apart from the budgerigar, perhaps the African love-birds are coming most into popular favour. If a domestic bird can be defined as one which has an organised fancy and in which named varieties have been produced, it cannot be very long before the love-birds fall into this category. Already the many local cage-bird societies are having special classes at their shows for these handsome and compact little birds, and the blue varieties now appearing, which a decade ago commanded fantastic prices, are now becoming more common. Quite a few are breeding every year in the aviaries on the north bank of the Regent's Canal."

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At the general meeting of the reconstituted Parliamentary and Scientific Committee at the House of Commons, Captain L. F. Plugge, M.P., was unanimously elected chairman.

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The National Pony and Arab Horse Show will not be held in 1940.

Correspondence

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

The views expressed in letters addressed to the Editor represent the personal view of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

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THIS GAS BUSINESS

To the Editor of the Veterinary Record

Sir,—Is it not about time that we had an authoritative and expert pronouncement on this matter of poisonous gas and the prevalence of gas masks?

Many of the men who were in the last war and in the war in Spain tell us that gas bombs are not dropped from aeroplanes but shot from the ground. If this is so it would seem that the Germans or other enemies would have to land in England or on the shores of Great Britain and Ireland before gas will trouble us. It is asserted that the manufacture of gas bombs is expensive and dangerous and on a question of finance "he who runs may read."

In *The Journal of the Royal Institute of Public Health and Hygiene* for October, 1939—an address by Findlay Murchie, M.B., Ch.B. (Ministry of Health)—it was stated: "Attention to the danger of gas heretofore has had to be emphasised out of all proportion to other precautions. I see no reason for over-anxiety. Those of you who took part in the last war will recollect that the French peasants in areas where gas was used took little or no precaution beyond shutting their doors and windows and remaining indoors during big attacks. . . . In long discussions with Spanish doctors on questions arising out of the war I have never heard any reference to the dangers of gas but they are all impressed by the amount of danger to life and property that could be inflicted by the heavy modern high-explosive bomb."

In the discussion that followed the address Dr. A. G. G. Thompson, M.O.H., Lambeth, said (to quote the report) that, "Dr. Murchie had indicated that too great stress had perhaps been laid by the Home Office on the necessity of providing gas masks for all. Other matters which should have received early attention as well had been overlooked."

A writer in *The Manchester Evening Chronicle* (A. F. M. of Denton) who fought in the last war, states: "Mustard gas was always sent over in shells by the artillery and I have yet to meet anyone who saw it dropped from the air."

The perishable nature of gas masks even with great care is said to be evidenced after six months' interval and the focus of the eye-piece goes all wrong with much oscillation. What, then, will be the value of those waggling on the backs of pedestrians and those that many children are making toys of and flinging about?

At the end of this war the profit and loss account of this gas mask business, if one is ever published, will be a matter of interest.

It is said by the *cognoscenti* that at any rate the carrying of a gas mask has a good psychological effect on its bearer. To the thinking man the psychological effect will be somewhat similar to the contemplation of the aspect of "a tom tit on a round of beef."

Yours sincerely,

G. Mayall.

Bolton.

SALE OF HORSEFLESH REGULATIONS

To the Editor of the Veterinary Record

Sir,—May I be permitted to refer to a statement regarding the sale of horseflesh regulations reported in the proceedings of the Central Veterinary Society. The statement, which reads as follows, "if a butcher sold horseflesh in a shop without displaying the fact he was rendering himself liable to very heavy penalties" is incorrect.

A butcher is only liable if he sells horseflesh for *human consumption* without displaying notice of the fact. Where horseflesh is sold, other than for human consumption, the onus is upon the person exposing it for sale of proving that it was not intended for human consumption. Obviously this onus may be discharged in various ways.

The frequency with which confusion arises over this point prompts me to call attention to it, because it is frequently important in the course of routine meat inspection duties.

Yours faithfully,

L. B. A. Grace,

Veterinary Officer and Chief Meat Inspector for the City of London.

Meat Inspector's Office,
Central Markets,
Smithfield,
London, E.C.1.

December 12th, 1939.

V.V.B.F. CHRISTMAS APPEAL

To the Editor of the Veterinary Record

Sir,—I would like to thank you, Mr. Editor, for the kind thought which prompted you to write commending my appeal for subscriptions towards our Christmas Gift Fund. I am glad to report that, up to the moment of writing this letter, we have received a little over £27—but this is not enough to permit a gift to each of our recipients. I trust, therefore, that you will be able to find room to publish this letter of thanks which may, I hope, remind those who intend to send a subscription to do so soon. We want to send our gifts in time to provide a few extra comforts at Christmas for those in need.

One member sends a subscription as a thank offering for the success of a student in the recent examinations. Perhaps many others will be willing to imitate this excellent example. All subscribers can be assured that the money received will be well spent. Perhaps it will be well to repeat that subscriptions should be sent to the Secretary, Dr. Bullock, at 30, Park Lane, Wembley.

J. W. Brittlebank,
President.

Wimborne House,
Sawbridgeworth.

December 12th, 1939.

DISEASES OF ANIMALS ACTS, 1894 TO 1937, AND AGRICULTURE ACT OF 1937 (PART IV)

SUMMARY OF RETURNS

Period.	Anthrax.		Foot-and-Mouth Disease.		Parasitic§ Mange.		Sheep Scab.	Swine Fever.	
	Outbreaks confirmed.	Animals attacked.	Outbreaks confirmed.	Animals slaughtered as diseased or exposed to infection.	Outbreaks confirmed.	Animals attacked.	Outbreaks confirmed.	Outbreaks confirmed.	Swine slaughtered.
	No.	No.	No.	No.	No.	No.	No.	No.	No.
Period 16th to 30th Nov., 1939	21	26	1	45	1	1	22	188	134
Corresponding period in 1938	36	36	7	1,106	—	—	29	90	99
1937	47	54	24	4,710	2	2	11	30	9
1936	17	24	15	917	2	2	17	73	34
Total 1st January to 30th Nov., 1939	666	757	86	10,715	33	73	246	2,965	1,923
Corresponding period in 1938	752	1,145	176	22,367	45	75	184	831	674
1937	655	788	100	18,711	106	145	217	940	560
1936	405	481	38	3,645	101	243	205	1,756	1,206

Note.—The figures for the current year are approximate only. § Excluding outbreaks in Army Horses.

Tuberculosis (Attested Herds) Schemes

The number of Attested Herds, *i.e.* herds officially certified as free from tuberculosis, as at 30th November, 1939, was as follows:— England 3,144 ... Wales 7,489 ... Scotland 2,473 ... Total (Great Britain) 13,106